

## More Than Just Fun and Games?

### An Investigation of the Link Between Video Game Play and Cognitive, Perceptual, and Attentional Skills

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## Thank You!

As of May 31, 2021, I have completed my bachelor thesis. Thank you very much to all the people who have participated in my study – of which there were 320 in total (!) – as it was thanks to you that I could make this project a reality! The raffle winnings (two Steam Store as well as two Riot Point gift cards) were handed out on March 31, 2021.

## A Short Refresher

Around winter of 2020/21, I ran an online survey with League of Legends players and people who do *not* play video games (non-video game players) from all around the world, comparing their performance in two reaction time tasks and a visual search task. You may remember those tasks by the following pictures and how you had to repeatedly press certain keys on your keyboard 😊

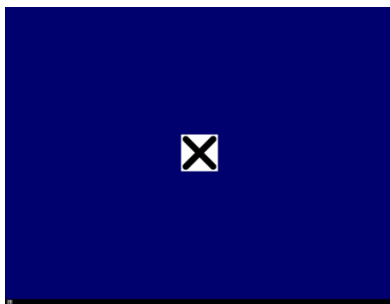


Figure 1: Simple reaction time task

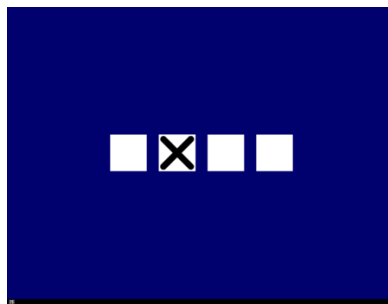


Figure 2: Choice reaction time task

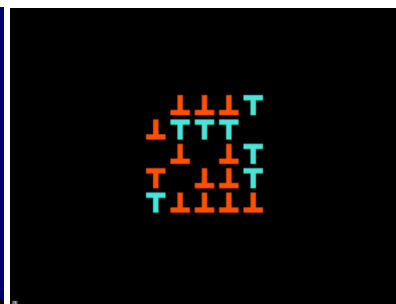


Figure 3: Visual search task

## Results

As of today, the world counts around **2.55 billion video game players**. Among the many games available to them, **League of Legends (LoL)**, a Multiplayer Online Battle Arena game, **counts among the most popular**.



Not only does its rapid pace and action-filled content make it fun, it also places a high demand on the players' cognition, perception and attention. With my thesis, **I thus looked at the way in which playing such a game is linked to improved performance on certain cognitive tasks**. For that, I compared **how *quickly* (reaction time) and *accurately* (error rate)** people from either group performed on three online-administered tasks: A simple reaction time task (figure 1), a choice reaction time task (figure 2), and a visual search task (figure 3). After statistical evaluation, the **results showed LoL players significantly outperforming non-video game players across all tasks**, with effects ranging from medium-sized to large! More concretely, on average, LoL players were **between 16 to 185 milliseconds quicker** than non-video game players, the largest differences being detected for the visual search task. However, keep in mind that this does *not* apply to each and every one of you – in some cases, non-video game players were actually quicker than LoL players ;-)

Moreover, the data has shown that **age** had an **additional significant effect** on task performance, with **younger participants achieving better results on average** (on all tasks). I also checked for the effects of education, gender, and how long ago the participant last played video games but found no differences there (which doesn't mean there aren't any! This statement only holds true for this particular group of people – I know, research is odd..).

Lastly, I wondered whether there were **differences among LoL players** (212 people) when **differentiated by skill** (measured via MMR – or ELO, for the old school players). I know, I know, a higher MMR respectively in-game rank does not always mean you're better, but it's a decent proxy ☺ Anyway, to my surprise, skill level was only significantly correlated with performance on the simple reaction time task, meaning that **the higher-skilled the player, the quicker was their reaction time on said task, but not the others**. However, associations with performance on the other tasks did also register some small effects, they simply didn't reach statistical significance (if you're not sure what that means: There does seem to be a relationship between them, but that relationship was not clear enough for me to be able to speak of a "meaningful difference". This can be due to a range of reasons.)

In summary, this tells us that **we see three factors being relevant to cognitive performance**:

- Whether you play League of Legends or not
- How old you are
- How skilled you are in your game play

**Remember** that I looked at just a few very specific cognitive skills (in this case it was processing speed and visual search, also captured in the context of very specific tasks), and while I'm grateful to have had multiple hundred participants, this **does not mean my findings hold true for all LoL players or all non-video game players**. In fact, my findings really open up more questions than they answer: Would other researchers find the same thing if they conducted the same study again? Do LoL players react more quickly and accurately in other contexts, too (say, driving)? What game elements of LoL may be the most relevant in terms of driving improvement in cognitive performance? The list goes on...

**If you're interested in reading more** on the topic, there are a number of researchers that have done extensive work in the field. I've **linked some of their work in the pages below** (including some of the materials I used for my own study, like the video game play questionnaire by Bavelier et al.). The ones marked in yellow I find particularly insightful!

## Further Readings

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